Remarks

The various parts of the Office Action are discussed below under appropriate headings.

Claim Rejections - 35 U.S.C. § 112

Claims 1-14 have been rejected as being indefinite because of the recitations of "encoding signatures" and "decoding signature". The objected to terms have been removed from the claims, so the rejection under 35 U.S.C. 112 is now moot.

Claim Rejections - 35 U.S.C. § 102 and § 103

The claims have been rejected as being anticipated by or unpatentable over US 5,760,941 (Young et al.), the Tsuda et al. article, US 4,217,488 (Hubbard), US 6,087,655 (Kobrin) and/or US 6,313,771 (Munroe et al.).

Independent claims 1 and 15

The Examiner rejected independent claims 1 and 15 as being anticipated by Young et al. In view of the amendments made to claims 1 and 15, this rejection is now moot.

Claims 1 and 15 have been amended more clearly to define patentably over the disclosure of Young et al. Specifically, the transmitter is now specified as being a drive-signal-based encoder that encodes the optical signal using an electrical signal, and the receiver is specified as being a superstructure fibre Bragg grating (SSFBG). Thus, the transmitter is an active encoding device that relies directly on an electrical signal to perform its encoding function, and the receiver is a passive decoding device that uses optical features to perform its decoding function.

In contrast, Young et al describe an OCDMA system using bipolar codes. A modulated data signal is generated using conventional optoelectronic apparatus, which is then encoded using passive bulk grating filters. Thus, the actual encoding of the signal is passive, with no utilization of electrical encoding signals. The decoding function is similarly performed using bulk optics. Figures 5B and 6B depict the encoder and decoder respectively, from which it is readily apparent that these devices are both bulk optic devices. Thus, Young et al describe an optical encoding/decoding process

that uses bulk optics for the encoding of data bits, which is clearly different from the apparatus and method of amended claims 1 and 15.

The other prior art documents cited by the Examiner similarly fail to disclose the claimed active encoder and passive decoder transmission system. Tsuda et al describes spectral encoding and decoding in which the encoding and decoding functions are performed by a photonic spectral encoder and decoder pair using high resolution arrayed-waveguide gratings (see last sentence of abstract, for example). Thus, both encoder and decoder are passive optical devices. Hubbard describes electrical modulation of a laser output with an encoding signal, to give a signal that is then transmitted and received. No mention is made of any form of passive optical decoding at the receiver to decode the transmitted signal. Kobrin describes a fiber grating encoder and method of manufacture. The document relates to position sensing by transverse coding, i.e. position coding, rather than the encoding of transmitted signals to which the present invention relates. Thus, any teaching of this document does not appear to be relevant to the present invention. Not only is Kobrin's encoder a position encoder rather than a signal encoder, it is a passive optical device rather than the active drive-signal-based encoder of claims 1 and 15, and further it is not disclosed in combination with a signal decoder, in particular not a passive signal decoder. Munroe et al teach an optical encoding and decoding system which uses passive fiber Bragg grating components for both encoding and decoding. The components are cascaded together to generate a greater code space, with circulators used to couple light to and from the encoders. No active drive-signal-based encoder is discussed.

Thus, none of these documents teaches or suggests an optical transmission system comprising an active drive-signal-based encoder for encoding an optical signal with an electrical encoding signal and a passive decoder in the form of a SSFBG to decode the encoded signal. All of the documents fail to recognise the claimed inventive concept of combining an active encoder and passive decoder in a single transmission system. Thus, claims 1 and 15 are believed to be allowable over these documents.

Independent apparatus claim 16

The Examiner has rejected this claim as being anticipated by Tsuda et al. In so doing, the Examiner has equated the claimed apparatus to Tsuda's entire system including an encoder and a decoder, where the decoder includes a filter. However, claim 16 is directed to an optical transmitter in which an SSFBG is used for its filtering

function to remove nonlinearities and distortions induced by the encoder. Thus, claim 16 covers an optical transmitter comprising an optical source for generating a modulated signal together with a filtering grating to compensate distortion caused by the modulation process. The transmitter of claim 16 differs from the system of Tsuda et al, at least in that Tsuda et al's filtering is performed in a decoder, and not in the encoder/modulator.

It is appreciated that the presence of the term "decoder" in the final paragraph of claim 16 might lead to confusion over the intended scope of the claim. Therefore, to address this point and to clearly distinguish from Tsuda et al, this term has been removed, and the grating instead specified as being a superstructure fiber Bragg grating. Further, claim 16 has been amended to specify that the modulation is performed by encoding the optical signal with an electrical encoding signal. In other words, the optical source is an active device. This further distinguishes from Tsuda et al who describe a passive AWG encoder. Tsuda et al neither teach nor suggest that a passive fiber grating may be incorporated into an optical transmitter and used to compensate for distortion in an optical signal caused by modulating with an electrical encoding signal.

The other cited prior art documents likewise fail to teach the features of claim 16. Of all the documents, only Hubbard describes a transmitter that is not a passive optical device; he describes electrical modulation of an optical signal. However, he does not teach or suggest providing a SSFBG for distortion compensation. Thus, it is submitted that claim 16 is allowable over the cited documents.

Conclusion

In view of the foregoing, request is made for timely issuance of a notice of allowance.

Respectfully submitted,

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